cannot ſay; but from that quarter where the greateſt quantity of the vapour ſeemed to be in motion, the ſound was plaineſt; and this, during my obſervation, was the eaſtern. The ſcene laſted about half an hour, though the whole night was as light as when the moon is in the quarters."

N° XXII.

A Letter from J. MADISON, *Eſq. to* D. RITTENHOUSE, *Eſq. containing Experiments and Obſervations upon what are commonly called the Sweet Springs.*

THESE waters riſe on the north ſide of a large mountain at the foot of it, called the Sweet Spring Mountain, in the county of Botetourt. The ſouth ſide is covered with ſtones of an ocrous appearance. In many places iron ore may be found; but on the north the mountain is fertile, covered with a rich mould, at leaſt near the ſpring. The remarkable efficacy of theſe waters in many diſorders, eſpecially, it is ſaid, in conſumptive complaints, firſt induced me to attempt their analyſis. Such experiments as I had time and opportunity to make, I ſhall faithfully relate, and leave it to others, better qualified than myſelf, to judge of their merits.

Experiment 1. Having plunged a very ſenſible mercurial thermometer in the ſpring, it ſtood at 73°. The temperature of air was about 69.

2. A good hydrometer ſunk one-twentieth of an inch deeper in common mountain water, than in the ſpring.

3. Nut-galls mixed with the water in a wine glaſs ſtruck a paliſh brown, which ſhewed that there was little or no iron in it.

4. Violets mixed with the water in a wine glaſs, turn-

ed it in a ſhort time of a reddiſh colour. This was a proof that the waters contained ſome kind of acid.

5. Having made a ſolution of ſilver in the nitrous acid, and mixed a little of it with the water, it immediately became milky, and a white pulvurent precipitate enſued. This experiment ſhewed by the whiteneſs of the precipitate, that the waters contained nothing ſulphureous, and by the pulvurency of the precipitate that the acid contained in the waters was vitriolic.

6. A ſolution of lead in the nitrous acid being mixed with the water, it became ſomewhat milky, and a white precipitate was obſerved. This experiment alſo ſhews that the waters contain an acid, moſt probably the vitriolic, and alſo that they contain calcareous earth. Soap is not readily miſcible with them.

7. A ſolution of ſaccharum ſaturni in the nitrous acid being made, and lines marked upon paper with it, and placed over the water, the lines retained their former colour. This experiment alſo ſhews that the water contains nothing ſulphureous.

8. Having poured a little of the ſpirit of ſalt into the water, after ſome time a coloured precipitate was obſerved, but as the waters did not ſtrike a green or blue colour, it ſhewed that there was no copper in them.

9. A ſolution of vitriol of copper mixed with the water produced a thick, green, curdly appearance, but did not become bluer. This experiment ſhewed that there was no vol. alkali contained in them.

10. The vitriolic acid mixed with the water ſuddenly effervеſced, and produced a heat which raiſed the thermometer from 75 to 83, by applying the bulb to the outſide of the glaſs.

11. As the ſpring is continually diſcharging large bubbles of air, which riſing from the bottom break upon the ſurface of the water, I was deſirous of making ſome experiments upon the air, in order to determine whether the

the acidity of the water might not be owing to it; and alſo to determine the nature of the air, whether fixed or not. Having therefore caught a quantity of the air in a decanter, I communicated a part of it to an equal bulk of pure mountain water, and after agitating them for ſome time, gave it to ſeveral to taſte; who agreed that it had the taſte of the ſpring water. Upon a ſecond trial this experiment did not ſucceed. I had not an opportunity of trying the nature of the air by means of chalk-water, and was prevented from proſecuting any farther enquiries into the nature of theſe celebrated waters by a ſudden alarm, to which the frontiers were then continually expoſed.

Theſe waters have been falſely called *ſweet*, for their taſte is evidently acidulous. The experiments alſo ſhew that they contain an acid. Their taſte reſembles exactly that of waters artificially impregnated with fixed air, extricated from chalk, by means of the vitriolic acid, and I conceive muſt be nearly the ſame with the true Pyrmont water. They have little or no ſmell, do not form an incruſtation, nor do they leave a depoſit upon ſtanding many hours. Upon bathing in the morning, the ſkin has a ſoapy kind of feel. This was not obſerved in the evening.

There is near this ſpring another, a very ſtrong chalybeate.

I am, with great regard, yours,

J. MADISON.

N° XXIII.

A Letter from the Rev. JEREMY BELKNAP, *on the preſerving of Parſnips by drying.*

Dover, New-Hampſhire, March 5, 1784.

SIR,

Read Apr. 16, 1784. AMONG the number of eſculent roots, the *parſnip* has two ſingular good qualities.